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EXAMINER
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3737	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _05 August 2009_.
2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-17_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1-17_ is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _05 August 2009_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Claim Objections

1.   Claims 1-17 objected to because of the following informalities:

The preamble of claim 1 refers to a method for "a body such as the heart". The preamble language encompasses embodiments wherein the body is not the heart, yet all steps set forth in the claim are directed towards the heart only. Therefore, in the embodiment wherein the body is not the heart, the claim does not set forth any method steps, rendering the claim unclear.

In line 2 of claim 1, "the heart" lacks proper antecedent basis.

In line 3 of claim 11, "the heart" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3.   Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "the continuous change in the heart volume" without sufficient antecedent basis.

Claim 11 recites "the heart volume" and "the changing heart volume" without sufficient antecedent basis.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1-8, 11, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chenal et al (US PG Pubs. No. 2002/0072671), hereinafter Chenal ('671), of record, in view of Detmer (US Patent No. 6,443,896), hereinafter Detmer ('896).

Regarding claims 1, 3 and 6, Chenal ('671) teaches method of ultrasonically measuring the heart, including steps for repetitively acquiring ultrasonic images, using an automated processor to define corresponding object borders around the wall of a cardiac chamber in the ultrasonic images during the heart cycle, producing a plurality of quantified measures of the volume of the heart during the heart cycle from the borders, and displaying the plurality of quantified measures, wherein the reference measures constitute "measures of [a] continuous change in the heart volume" as claimed (Abstract, ¶ 0004, 0035). As the patient of Chenal ('671) is presumably still living during and following the procedure, it is reasonably inferred that, during the display step of Chenal ('671), the patient's heart is still beating and as such the reference meets the limitation of "displaying...as the heart beats". Chenal ('671) does not expressly teach acquiring the images in two intersecting image planes at substantially the same time.

In the same field of endeavor, Detmer ('896) teaches a method of ultrasonic imaging including steps for substantially simultaneously acquiring ultrasound images in two perpendicular planes, which constitute planes "which extend through the heart in different directions" as claimed, as well as steps for displaying the images in real time (col. 1 lines 47-65). Detmer ('896) teaches that biplane imaging is more efficient than traditional 3D imaging methods (col. 1 lines 31-50). It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Chenal ('671) to acquire the ultrasound images in a biplane manner and display them in real time as taught by Detmer ('896), in order to increase the imaging efficiency.

Regarding claim 2, Chenal ('671) teaches producing a graphical model of the heart using the defined borders, wherein producing quantified measures comprises producing measures using the graphical model (¶ 0023-0032).

Regarding claims 4 and 5, Chenal ('671) teaches producing a graphical display of changes in the heart as a function of time (¶ 0038-0041).

Regarding claims 7 and 16, Chenal ('671) teaches producing a display with a visually highlighted defined object border in each image, a real time graphical model using the object borders, and a quantified measure using the defined object border (¶ 0045, 0050).

Regarding claim 8, Chenal ('671) teaches use of the graphical model to produce a volumetric measure by the rule of disks (¶ 0040).

Regarding claims 11 and 17, Chenal ('671) and Detmer ('896) teach all features of the invention as previously discussed for claims 1 and 2.

6.   Claims 9, 10 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chenal ('671) and Detmer ('896) as applied to claims 2 and 11 above, and further in view of Mumm et al (EP 961135), hereinafter Mumm ('135).

Regarding claims 9, 12 and 14, Chenal ('671) and Detmer ('896) do not expressly teach using the automatically generated borders to produce a graphical model by creating a wireframe model. In the same field of endeavor, Mumm ('135) teaches steps for generating a 3D wireframe model of the heart using predefined contours (i.e. "curves") to fit a surface to the model, and further teaches that such wireframe modeling increases the efficiency of the modeling process (Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Chenal ('671) and Detmer ('896) to generate the graphical model using the wireframe modeling steps of Mumm ('135), in order to improve the efficiency of the modeling process.

Regarding claims 10 and 13, neither Chenal ('671), Detmer ('896) nor Mumm ('135) expressly teach the contours to be ellipses. However, it is well known in the art that the cardiac chambers are generally elliptical in shape. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the method of Chenal ('671), Detmer ('896) and Mumm ('135) using ellipses for the contours, in order to generate an accurate model of the heart.

Regarding claim 15, Chenal ('671) teaches use of the graphical model to produce a volumetric measure by the rule of disks (¶ 0040).

Response to Arguments

7.   Applicant's arguments filed 5 Aug 2009 have been fully considered but they are not persuasive.

Applicant alleges that Chenal fails to produce measures of the volume of the heart in real time (Remarks p. 9). Examiner notes that "real time" is only "real" in relation to some other event, and as the claim does not specify any such event, it is reasonably interpreted to mean merely that the result is produced as the method is performed. Furthermore, even if the claim were to properly set forth that the measurement must be made concurrently with the imaging step, Detmer teaches such feature as stated in the rejection.

   Applicant also argues that the rejection is improper because Detmer fails to suggest that the biplane technique can be used for making measurements. Examiner notes that Detmer is not relied upon as supply such step; rather, Chenal provides the teaching as stated in the rejection. Detmer and Chenal are in fact properly combined in view of the motivation provided by Detmer, which is that biplane imaging is efficient.

   As Applicant's arguments are wholly unpersuasive for at least the foregoing reasons, claims 1-17 remain rejected as unpatentable over the prior art of record as detailed herein.

8.   Applicant's amendments of 5 Aug 2009 are effective to overcome the previous objections to the specification and drawings, which are hereby vacated accordingly.

Conclusion

9.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

   A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

   Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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